THE PREVENTION OF DEEP VENOUS THROMBOSIS

Original Release/Approval		25 Dec 2004	Note: This CPG requires an annual review.	
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Supersedes:	The Prevention of Deep Vein Thrombosis, updated Apr 2008			

1. Goal. To establish guidance for anti-thrombotic therapy for the prevention of deep venous thrombosis (DVT) and pulmonary embolism (PE) in combat casualties.

2. Background.

a. American College of Chest Physicians Conference recommended that, "every hospital should develop a written policy or other formal strategy for preventing thromboembolic complications, especially for high-risk patients."

b. Proximal deep venous thrombosis (DVT) continues to be a frequent complication in hospitalized patients. Pulmonary embolism, a very serious potential outcome from DVT, has been seen in over 20% of patients hospitalized with DVTs in national reviews and is a major cause of morbidity and mortality in these patients.

c. There is an increasing recognition of DVT in individuals who complete an extended period of travel on an airplane. One study noted a 10% prevalence of asymptomatic DVT in individuals undergoing flights of 8 hours or more. Landstuhl Regional Medical Center is uniquely positioned to receive patients who have undergone extensive periods of travel prior to admission.

d. Different medical societies and working groups have published varying recommendations for DVT prophylaxis. Where these recommendations disagree, the clinical guidelines recommended here represent the guideline with either a higher level of scientific evidence supporting the recommendation, or the more conservative recommendation.

e. Due to the increasingly short aeromedical evacuation times achieved in our system today, it may be possible that certain patients will still be receiving blood product therapy to correct coagulopathy when they enter the chain. It is inherent on providers at each step in the aeromedical evacuation chain to evaluate patients for DVT prophylaxis and make adjustments in therapy as clinically appropriate. ***It is recommended to begin DVT prophylaxis therapy as soon as coagulopathy is corrected in patients not otherwise at increased risk of bleeding.***

3. Education and Treatment.

See Appendix A for specific guidance on different subsets of patients after various surgical procedures.

4. Responsibilities.

a. All Health Care Providers will:

1) Become familiar with the guidelines for the prevention of DVT (see Appendix A).

2) Appropriately manage patients who may be at risk of developing DVT.

3) Provide feedback on these guidelines and suggestions for changes to the CPG to the JTTS Theater Trauma Director.

b. The Senior surgeon and/or Intensivist at each Level III facility will:

1) Review all thromboembolic events in the Level III facility to assess ways to reduce the risk to the patient.

2) Coordinate with the Theatre Trauma Coordinator on the appropriateness of the guidelines being used and provide input for updates on an as needed basis.

5. References.

[1] The Seventh ACCP Consensus Conference on Antithrombotic and Thrombolytic Therapy: Evidence-Based Guidelines, Chest; 126:3(Supplement), September 2004

[2] Practice Management Guidelines for the Management of Venous Thromboembolism in Trauma Patients, Eastern Association for the Surgery of Trauma, www.east.org, May 8, 2006

[3] Scurr JH; Machin SJ; Bailey-King S; Mackie IJ; McDonald S; Smith PD, "Frequency and Prevention of Symptom-less Deep Venous Thrombosis in Long Haul Flights: A Randomized Trial, Lancet 357:1485-9, 2001

[4] Knudson MM, Morabito D, Paiement GD, et al: Use of low molecular weight heparin in preventing thromboembolism in trauma patients. J Trauma 41:446-59, 1996

[5] Knudson MM, Lewis FR, Clinton A, et al: Prevention of venous thromboembolism in trauma patients. J Trauma 37:480-7, 1994

[6] Geerts WH, Code KJ, Jay RM, et al: A prospective study of venous thromboembolism after major trauma. N Engl J Med 331:1601-6, 1994

[7] Geerts WH, Jay RM, Code KJ, et al: A comparison of low-dose heparin with low-molecular weight heparin as prophylaxis against venous thromboembolism after major trauma. N Engl J Med 335:701-7, 1996

[8] Knudson MM: Thromboembolism after trauma: an analysis of 1602 episodes from the American College of Surgeons National Trauma Data Bank. Ann Surg 2004: 490-6

Approved by CENTCOM JTTS Director, JTS Director and Deputy Director and CENTCOM SG

APPENDIX A

GUIDELINES FOR PREVENTION OF DEEP VENOUS THROMBOSIS	
Risk Group	**Prophylactic Measures**
TRAUMA SURGERY	
Emergency trauma surgical procedures in patients with prohibitive risk of bleeding, or ongoing coagulopathy	SCD (sequential compression device) until able to be anticoagulated (ideally start Lovenox within 12 hours of cessation of coagulopathy); see IVC filter and Duplex screening sections below.
Emergency trauma surgical procedures in all patients, except patient with prohibitive risk of bleeding (once coagulopathy not present)	Lovenox 30 mg BID; *strongly* consider adding SCD
Isolated major orthopedic surgery of extremities, spine, and pelvis	SCD + Lovenox 30 mg BID; See IVC filter section below Continue tx for 7-10 days post-op
IVC FILTER PLACEMENT*	
Patients with: 1. Recurrent PE despite full anticoagulation 2. Proximal DVT and contraindications for full anticoagulation 3. Proximal DVT and major bleeding while on full anticoagulation 4. Progression of iliofemoral clot despite anticoagulation	Level I evidence for placement of IVC filter * removable filters preferred; document carefully in record and TMDS; PE may still occur despite IVC filter
Patients with established DVT or PE and: 1. Large free-floating thrombus in the iliac vein or IVC 2. Following massive PE in which recurrent emboli may prove fatal 3. During/after surgical embolectomy	Level II evidence for "extended" indications for prophylactic IVC filter for patients with established DVT or PE

GUIDELINES FOR PREVENTION OF DEEP VENOUS THROMBOSIS	
Risk Group	**Prophylactic Measures**
Very High Risk Patients: those who cannot receive anticoagulation because of increased bleeding risk and : 1. Severe closed head injury (GCS<8) 2. Incomplete spinal cord injury with paraplegia or quadriplegia 3. Complex pelvic fractures with associated long-bone fractures 4. Multiple long-bone fractures	Level III evidence for consideration of placement of prophylactic placement of IVC filter. Impact of retrievable filters is unclear in this patient population
ROLE OF DUPLEX SCREENING	
Asymptomatic patients	Serial duplex ultrasound imaging of high-risk patients may be cost-effective and decrease the incidence of PE (Level III)
Symptomatic patients	Duplex ultrasound may be used without confirmatory venography (Level I)
GENERAL SURGERY	
Low Risk:	
– minor procedure in patients < 40 years, no risk factors	Early mobilization
Moderate Risk:	
– minor procedure with additional risk factors for thrombosis; – non major surgery in patients 40-60 years, with no additional risk factors; – major surgery in patients < 40 years with no additional risk factors)	Unfractionated Heparin 5000 units BID ***or*** Lovenox 40 mg QD
Higher Risk:	
– non major surgery in patients > 60 years or have additional risk factors; – major surgery in patients > 40 years or	Unfractionated Heparin 5000 units TID ***or*** Lovenox 30 mg BID

GUIDELINES FOR PREVENTION OF DEEP VENOUS THROMBOSIS	
Risk Group	**Prophylactic Measures**
have additional risk factors	
High Risk:	
– patients with multiple risk factors	Unfractionated Heparin 5000 units TID *or* Lovenox 30 mg BID ***plus*** GCS (graduated compression stocking) *or* SCD
Moderate Risk or Higher Patients with high risk of bleeding	GCS or SCD
VASCULAR SURGERY	
Patients without additional thromboembolic risk factors	No need for thromboprophylaxis
Patients with additional thromboembolic risk factors	Unfractionated Heparin 5000 units BID *or* Lovenox 40 mg QD
UROLOGIC SURGERY	
Low Risk urologic procedures	Early ambulation
Major, open urologic procedures	Unfractionated Heparin 5000 units BID or TID
Patients actively bleeding or at risk for bleeding	GCS or SCD
Patients with multiple risk factors	GCS or SCD **and** Unfractionated Heparin 5000 units BID or TID or Lovenox 40 mg QD
NEUROSURGERY	
Intracranial neurosurgical procedures	SCD with or without GCS
High Risk neurosurgery patients	SCD and/or GCS OK to use Lovenox following stable CT scan in consultation with neurosurgeon